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10/659,184	09/10/2003	Yadong Li	138543 (553-1077)	7486

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DEAN D. SMALL
THE SMALL PATENT LAW GROUP LLP
225 S. MERAMEC, STE. 725T
ST. LOUIS, MO 63105

EXAMINER	
MOTSINGER, SEAN T	

ART UNIT	PAPER NUMBER
2624	

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/659,184	LI ET AL.	
	Examiner	Art Unit	
	SEAN MOTSINGER	2624	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 August 2008*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *28-47* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *28-47* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *10/28/2008*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

Response to Applicants Arguments

1. Applicants arguments and amendments field on 10/28/2008 have been entered and made of record.

2. Applicants arguments with respect to Weisman have been fully consider but are not persuasive. Applicant has argues that "one skilled in the art would not be motivated to replace the speckle reduced , edge detected and color quantized images of Weisman with multiple speckle reduced versions of the same raw image merely because the speckle reduced image may initially be selected with light heavy or moderate speckle reduction." and therefore is presumably attempting to argue that such a lack of motivation refutes a conclusion of obviousness. The examiner disagrees with this argument because this is not a requirement for showing obviousness in view of *KSR Int'l v. Teleflex, Inc.*, 127 S. Ct. 1727, 1740-41, 82 USPQ2d 1385, 1396 (2007). . Since the claimed invention is merely a simple combination of differently speckle reduced images (light, heavy, ect.) and displaying differently filtered images on the same screen (speckle reduced, color quantized, ect.) both disclosed in Weisman. The claimed invention no is more the a predicable combination of known elements according to their established functions. Therefore the combination is obvious even if there is no explicit disclosure of displaying multiple, differently speckle reduced images on the same screen.

Rejections Under 35 U.S.C. 101

35 U.S.C. 101 reads as follows:

> Whoever invents or discovers any new and useful process, machine, manufacture, or composition of matter, or any new and useful improvement thereof, may obtain a patent therefor, subject to the conditions and requirements of this title.

3. Claim(s) 28-35 and 38-45 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention. Supreme Court precedent[1] and recent Federal Circuit decisions[2] indicate that a statutory "process" under 35 U.S.C. 101 must (1) be tied to another statutory category (such as a particular apparatus), or (2) transform underlying subject matter (such as an article or material) to a different state or thing. While the instant claim(s) recite a series of steps or acts to be performed, the claim(s) neither transform underlying subject matter nor positively tie to another statutory category that accomplishes the claimed method steps, and therefore do not qualify as a statutory process. For example the processor of claims 28 and 38 do not positively recite any structural element which is tied to the method.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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[1] *Diamond v. Diehr*, 450 U.S. 175, 184 (1981); *Parker v. Flook*, 437 U.S. 584, 588 n.9 (1978); *Gottschalk v. Benson*, 409 U.S. 63, 70 (1972); *Cochrane v. Deener*, 94 U.S. 780, 787-88 (1876).

[2] *In re Bilski*, 88 USPQ2d 1385 (Fed. Cir. 2008).

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

4. Claims 28, 30, 32, 34-35 and 37 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman").

5. Re claim 28 Weisman discloses receiving a processed data stream from a processor (echo machine column 12 lines 50-55) filtering the processed data stream with a first value set of speckle reduction parameters to produce a first image stream (moderate speckle reduction column 13 lines 1-5); filtering the processed data stream with a first value set of speckle reduction parameters to produce a first image stream (hevey speckle reduction column 13 lines 1-10) and simultaneously co-displaying on a common screen a first image speckle reduced image that's is generated from the first image data stream, and other images (see figure 5 column 13 lines 1-13).
6. Weisman shows four images that are simultaneously co-displayed on a common screen, one of which is the raw image. The image next to the raw image is the speckle reduced image. The image under the raw image is generated from edge detection parameters applied to the speckle reduced image. The image diagonal to the raw image is generated from color quantization parameters applied to the speckle reduced and edge detected image. Weisman in col. 13 lines 1-6 states that "The physician may then choose one of several processing combinations from

menus. The default is for processing average images with moderate speckle. However, the physician may also choose options for light or heavy speckle." Weisman does not expressly disclose wherein the second speckle reduced image is generated from the second image data stream (see the filter and enhance buttons in figs. 5 and 7 and see col. 13 lines 2-4).

7. Since Wiseman discloses both the multiple filtered versions of a raw image that are co-displayed in figure 7 and multiple speckle filtered versions of the raw image produced by the adjustable speckle reduction parameters in col. 13 lines 1-6 the combination of which yields the predictable result of a simultaneous co-display of lightly filtered, moderately filtered, and heavily filtered speckle reduced images. The combination of the aforementioned elements would therefore have been obvious to one of ordinary skill in the art.

8. Re claim 30 Weisman discloses simultaneously co-displaying, comprises simultaneously co-displaying in a dual mode (quad screen column 13 lines 5-10) said method further comprising, enabling a user to enter the dual display mode at least one of during a scan, a replay of pre-recorded cine loops, and a display of a still image that is not updated periodically (video source see column 12 lines 54-column 13 line 15).

9. Re claim 32 Weisman discloses simultaneously co-displaying an original unfiltered image on the common screen with the first speckle reduced images wherein the

unfiltered image is generated from the processed data stream (column 13 lines 1-15).

10. Re claim 34 Weisman discloses wherein the first speckle reduced image has less speckle reduction than the second speckle reduced image (column 13 lines 1-13)

11. Re claim 35 Weisman discloses wherein filtering the processed data stream with a second value set of speckle reduction parameters comprises changing the values of the first values set or speckle reduction parameters (column 13 lines 1-15) during at least one of a scan (column 12 lines 54-67).

12. Re claim 37, claim 37 is rejected for similar reasoning to that of claim 28.

13. Claims 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman") in view of Hatfield et al US 5954,653.

14. Re claim 29 Wiesman discloses the elements of claim 28. Hatfield discloses increasing a range over which values of data included in the image data stream are distributed to improve contrast of a filtered image generated from the image data stream (entire application beginning with the title).

15. It would have been obvious to one of ordinary skill in this art at the time of invention to include the enhanced contrast method of Hatfield with the ultrasound speckle reduction filter of Weisman, for the benefit of being able to achieve the best image quality when performing three-dimensional reconstruction of ultrasound images, as taught by Hatfield in column 2 lines 50-54.

16. Claims 31 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. in view of Hwang US 4,887,306.

17. Re claim 31 Weisman discloses the elements of claim 28 Hwang discloses the filtering step is based on adjustable parameters, the method further comprising: automatically, without user intervention, optimizing the parameters based on a scan of an imaging system and what is being imaged (col. 2 line 48 through col. 3 line 2)

18. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the speckle noise filter of Weisman to adaptively adjust the filter parameters based on what is being imaged. In this case, the particular known problem that an ultrasound of a liver produces more speckle than an ultrasound of cardiac valves was solved by the known technique of adjusting the speckle reduction parameters adaptively, without user intervention as disclosed by Hwang. One of ordinary skill in the art can combine the filtering of Weisman with the adaptive filtering of Hwang to yield the predictable result of filtering data subsets adaptively based on what is being imaged to generate a speckle reduced image.

19. Claims 33 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. in further view of Kamath et al US 6,879,988.

20. For claim 33 Weisman discloses all of the elements of claim 28 and a speckle reduction filter. Figure 7 of Kamath discloses dividing the processed data stream into data subsets (step 72 partitioning data into regions and distributing regions onto processors) and simultaneously filtering the data subsets (step 75 thresholding wavelet coefficients of transformed data) and producing a first image data stream based on the filtered data subsets (original displaying format see abstract).

21. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the simultaneous filter of Kamath with the speckle noise filter of Weisman because Kamath provides the motivation at column 5 lines 3-7 of peforming "a substantial amount of processing on very large data sets," which can occur when "the data is in the form of images".

22. Claims 36 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman") in view of Prater et al US 5,322,067.

23. Re claim 36 Weisman discloses an ultra sound imaging system comprising:(a transducer array (column 1 lines 20-25) a processor for processing a receive beam

(column 5 lines 60-65)a scan converter and display controller operatively coupled to the transducer array and the processor, where in the scan converter and display controller are configured to and receiving a processed data stream from a processor (echo machine column 12 lines 50-55) filtering the processed data stream with a first value set of speckle reduction parameters to produce a first image stream (moderate speckle reduction column 13 lines 1-5); filtering the processed data stream with a first value set of speckle reduction parameters to produce a first image stream (hevey speckle reduction column 13 lines 1-10) and simultaneously co-displaying on a common screen a first image speckle reduced image that's is generated from the first image data stream, and other images (see figure 5 column 13 lines 1-13).

24. Weisman shows four images that are simultaneously co-displayed on a common screen, one of which is the raw image. The image next to the raw image is the speckle reduced image. The image under the raw image is generated from edge detection parameters applied to the speckle reduced image. The image diagonal to the raw image is generated from color quantization parameters applied to the speckle reduced and edge detected image. Weisman in col. 13 lines 1-6 states that "The physician may then choose one of several processing combinations from menus. The default is for processing average images with moderate speckle. However, the physician may also choose options for light or heavy speckle." Weisman does not expressly disclose wherein the second speckle reduced image is generated from the second image data stream (see the filter and enhance buttons in figs. 5 and 7 and see col. 13 lines 2-4).

25. Since Wiseman discloses both the multiple filtered versions of a raw image that are co-displayed in figure 7 and multiple speckle filtered versions of the raw image produced by the adjustable speckle reduction parameters in col. 13 lines 1-6 the combination of which yields the predictable result of a simultaneous co-display of lightly filtered, moderately filtered, and heavily filtered speckle reduced images. The combination of the aforementioned elements would therefore have been obvious to one of ordinary skill in the art.

26. Weisman does not explicitly recite a beam former however this feature is disclosed in Prater column 4 lines 15-20). The motivation to combine is covert the received ultrasound energy into a focuses receive beam (column 4 lines 15-20). Therefore it would have been obvious to combine the workstation in Weisman with the ultrasound machine in Prater.

27. Claims 38, 40, 42, and 44-46 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman") in view of Kamath.

28. Re claim 38 Weisman discloses receiving a processed data stream from a processor (echo machine column 12 lines 50-55), changing values of the speckle reduction parameters between first (low speckle reduction column 13 lines 1-13) and second (high speckle reduction column 13 lines 1-13) to for first and second image data streams, and simultaneously co-displaying on a common screen a first image

speckle reduced image that's is generated from the first image data stream, and other images (see figure 5 column 13 lines 1-13).

29. Weisman shows four images that are simultaneously co-displayed on a common screen, one of which is the raw image. The image next to the raw image is the speckle reduced image. The image under the raw image is generated from edge detection parameters applied to the speckle reduced image. The image diagonal to the raw image is generated from color quantization parameters applied to the speckle reduced and edge detected image. Weisman in col. 13 lines 1-6 states that "The physician may then choose one of several processing combinations from menus. The default is for processing average images with moderate speckle. However, the physician may also choose options for light or heavy speckle." Weisman does not expressly disclose wherein the second speckle reduced image is generated from the second image data stream (see the filter and enhance buttons in figs. 5 and 7 and see col. 13 lines 2-4).

30. Since Wiseman discloses both the multiple filtered versions of a raw image that are co-displayed in figure 7 and multiple speckle filtered versions of the raw image produced by the adjustable speckle reduction parameters in col. 13 lines 1-6 the combination of which yields the predictable result of a simultaneous co-display of lightly filtered, moderately filtered, and heavily filtered speckle reduced images. The combination of the aforementioned elements would therefore have been obvious to one of ordinary skill in the art.

31. Kamath discloses in figure 7 dividing the processed data stream into data subsets (step 72 partitioning data into regions and distributing regions onto processors) and simultaneously filtering the data subsets (step 75 thresholding wavelet coefficients of transformed data) and producing a first image data stream based on the filtered data subsets (original displaying format see abstract).

32. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the simultaneous filter of Kamath with the speckle noise filter of Weisman because Kamath provides the motivation at column 5 lines 3-7 of peforming "a substantial amount of processing on very large data sets," which can occur when "the data is in the form of images".

33. Re claim 40 Weisman discloses simultaneously co-displaying, , comprises simultaneously co-displaying in a dual mode (quad screen column 13 lines 5-10) said method further comprising, enabling a user to enter the dual display mode at least one of during a scan, a replay of pre-recorded cine loops, and a display of a still image that is not updated periodically (video source see column 12 lines 54-column 13 line 15).

34. Re claim 42 Weisman discloses simultaneously co-displaying an original unfiltered image on the common screen with the first speckle reduced images wherein the unfiltered image is generated from the processed data stream (column 13 lines 1-15).

35. Re claim 44 Weisman discloses wherein the first speckle reduced image has less speckle reduction than the second speckle reduced image (column 13 lines 1-13)

36. Re claim 45 Weisman discloses wherein filtering the processed data stream with a second value set of speckle reduction parameters comprises changing the values of the first values set or speckle reduction parameters (column 13 lines 1-15) during at least one of a scan (column 12 lines 54-67).

37. Re claim 46, claim 46 is rejected for similar reasoning to that of claim 38.

38. Claims 39 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman") and Kamath in view of Hatfield et al US 5954,653.

39. Re claim 39 Weisman and Kamath disclose the elements of claim 38. Hatfield discloses increasing a range over which values of data included in the image data stream are distributed to improve contrast of a filtered image generated from the image data stream (entire application beginning with the title).

40. It would have been obvious to one of ordinary skill in this art at the time of invention to include the enhanced contrast method of Hatfield with the ultrasound speckle

reduction filter of Weisman, for the benefit of being able to achieve the best image quality when performing three-dimensional reconstruction of ultrasound images, as taught by Hatfield in column 2 lines 50-54.

41. Claims 41 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weisman and Kamath in view of Hwang US 4,887,306.

42. Re claim 41 Weisman and Kamath disclose the elements of claim 38 Hwang discloses the filtering step is based on adjustable parameters, the method further comprising: automatically, without user intervention, optimizing the parameters based on a scan of an imaging system and what is being imaged (col. 2 line 48 through col. 3 line 2)

43. It would have been obvious to one of ordinary skill in the art at the time of invention to modify the speckle noise filter of Weisman to adaptively adjust the filter parameters based on what is being imaged. In this case, the particular known problem that an ultrasound of a liver produces more speckle than an ultrasound of cardiac valves was solved by the known technique of adjusting the speckle reduction parameters adaptively, without user intervention as disclosed by Hwang. One of ordinary skill in the art can combine the filtering of Weisman with the adaptive filtering of Hwang to yield the predictable result of filtering data subsets adaptively based on what is being imaged to generate a speckle reduced image.

44. Claims 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. in further view of Kamath et al US 6,879,988 in view of examiners official notice.

45. For claim 43 Weisman and Kamath disclose all of the elements of claim 38 and a speckle reduction filter the do not disclose a SIMD processor however it is norotriously well known in the art to use a SMID processor to simultaneously perform processing of data. The motivation to combine is well known to quickly and simultaneously process data. Therefore it would have been obvious to one of ordinary skill in the art to combine Weisman and Kamath to reach the aforementioned advantage.

46. Claims 47 is rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent Number 6,674,879 issued to Weisman et al. ("Weisman") and Kamath in view of Prater et al US 5,322,067.

47. Re claim 47 Weisman discloses an ultra sound imaging system comprising:(a transducer array (column 1 lines 20-25) a processor for processing a receive beam (column 5 lines 60-65)a scan converter and display controller operatively coupled to the transducer array and the processor, where in the scan converter and display controller are configured to and receiving a processed data stream from a processor (echo machine column 12 lines 50-55) filtering the processed data stream with a first

value set of speckle reduction parameters to produce a first image stream (moderate speckle reduction column 13 lines 1-5); filtering the processed data stream with a first value set of speckle reduction parameters to produce a first image stream (hevey speckle reduction column 13 lines 1-10) and simultaneously co-displaying on a common screen a first image speckle reduced image that's is generated from the first image data stream, and other images (see figure 5 column 13 lines 1-13).

48. Weisman shows four images that are simultaneously co-displayed on a common screen, one of which is the raw image. The image next to the raw image is the speckle reduced image. The image under the raw image is generated from edge detection parameters applied to the speckle reduced image. The image diagonal to the raw image is generated from color quantization parameters applied to the speckle reduced and edge detected image. Weisman in col. 13 lines 1-6 states that "The physician may then choose one of several processing combinations from menus. The default is for processing average images with moderate speckle. However, the physician may also choose options for light or heavy speckle." Weisman does not expressly disclose wherein the second speckle reduced image is generated from the second image data stream (see the filter and enhance buttons in figs. 5 and 7 and see col. 13 lines 2-4).

49. Since Wiseman discloses both the multiple filtered versions of a raw image that are co-displayed in figure 7 and multiple speckle filtered versions of the raw image produced by the adjustable speckle reduction parameters in col. 13 lines 1-6 the combination of which yields the predictable result of a simultaneous co-display of

lightly filtered, moderately filtered, and heavily filtered speckle reduced images. The combination of the aforementioned elements would therefore have been obvious to one of ordinary skill in the art.

50. Weisman does not explicitly recite a beam former however this feature is disclosed in Prater column 4 lines 15-20). The motivation to combine is covert the received ultrasound energy into a focuses receive beam (column 4 lines 15-20). Therefore it would have been obvious to combine the workstation in Weisman with the ultrasound machine in Prater.

51. Kamath discloses in figure 7 dividing the processed data stream into data subsets (step 72 partitioning data into regions and distributing regions onto processors) and simultaneously filtering the data subsets (step 75 thresholding wavelet coefficients of transformed data) and producing a first image data stream based on the filtered data subsets (original displaying format see abstract).

52. It would have been obvious to one of ordinary skill in the art at the time of the invention to include the simultaneous filter of Kamath with the speckle noise filter of Weisman because Kamath provides the motivation at column 5 lines 3-7 of performing "a substantial amount of processing on very large data sets," which can occur when "the data is in the form of images".

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to SEAN MOTSINGER whose telephone number is (571)270-1237. The examiner can normally be reached on 9-5 M-F.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jingge Wu can be reached on (571)272-7429. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Jingge Wu/
Supervisory Patent Examiner, Art Unit 2624

Motsinger
12/14/2008